CLAIMS

What is claimed is:

1. A polymer-enhanced asphalt emulsion comprising:

bitumen;

a block copolymer comprising styrene;

rosin; and

cationic asphalt emulsion.

2. The emulsion of claim 1 wherein said block copolymer comprising styrene comprises styrene-butadiene-styrene (SBS).

3. The emulsion of claim 1 wherein said bitumen comprises bitumen with a petroleum asphalt pen number of 10mm penetration.

4. The emulsion of claim 1 comprising between approximately 2 and 6 percent by weight bitumen.

5. The emulsion of claim 4 comprising between approximately 4 and 5 percent by weight bitumen.

6. The emulsion of claim 1 wherein said rosin comprises a high acid number.

7. The emulsion of claim 1 wherein said rosin is dimerized.

8. The emulsion of claim 1 comprising between approximately 0.02 and 2 percent by weight rosin.

9. The emulsion of claim 7 comprising between approximately 1 and 2 percent by weight rosin.

10. The emulsion of claim 1 comprising between approximately 20 and 40 percent by weight of water.

11. The emulsion of claim 10 comprising between approximately 30 and 35 percent by weight of water.

12. The emulsion of claim 1 comprising between approximately 0.5 and 20 percent by weight of block polymer comprising styrene.

13. The emulsion of claim 12 comprising between approximately 2 and 15 percent by weight of block polymer comprising styrene.

14. The emulsion of claim 1 wherein said cationic asphalt emulsion comprises an amine.

15. The emulsion of claim 14 wherein said amine comprises a quatenary amine.

16. The emulsion of claim 1 wherein said cationic emulsion comprises at least one emulsifying agent selected from the group consisting of amines, primary amines, diamines, quatenary amines, imidazolene amines and combinations thereof.

17. The emulsion of claim 16 wherein said cationic emulsion comprises at least one emulsifying agent selected from the group consisting of imidazoline dodecyl phenol, quatenary diamine phenol and combinations thereof.

18. The emulsion of claim 1 comprising between approximately 50 and 80 percent by weight of cationic emulsion.

19. The emulsion of claim 18 comprising between approximately 60 and 70 percent by weight of cationic emulsion.

20. The emulsion of claim 1 wherein said block copolymer comprises powder.

21. The emulsion of claim 1 further comprising an additional amine.

22. The emulsion of claim 21 wherein said additional amine is added to the bitumen/rosin.

23. The emulsion of claim 21 wherein said additional amine comprises between approximately 0.2 and 0.3 percent by weight.

24. The emulsion of claim 21 wherein said additional amine comprises ditaloamine.

25. A method of making a polymer-enhanced asphalt emulsion, the method comprising the steps of:

a) mixing block copolymer comprising styrene, rosin, and bitumen;

b) heating the block copolymer/rosin/bitumen mixture; and

c) mixing the block copolymer/rosin/bitumen mixture with cationic asphalt emulsion.

26. The method of claim 25 wherein step a) comprises the steps of mixing the block copolymer and rosin to form a dry mixture and adding the dry mixture to the bitumen.

27. The method of claim 25 wherein step c) comprises mixing a cationic asphalt emulsion comprising an emulsifying agent selected from the group consisting of amines, primary amines, quatenary amines, diamines, imidazolene amines and combinations thereof.

28. The method of claim 25 wherein step c) comprises mixing a cationic asphalt emulsion comprising an emulsifying agent selected from the group consisting of imidazoline dodecyl phenol, quatenary diamine phenol and combinations thereof.

29. The method of claim 25 wherein step a) comprises mixing powdered block copolymer.

30. The method of claim 25 wherein step c) comprises mixing using a mixer/stirred/blender apparatus comprising a shaft, a plurality of plates attached thereto, and a plurality of openings in at least two of the plates.

31. The method of claim 25 further comprising the step of applying the emulsion to a surface at ambient temperature.

32. An apparatus for mixing/stirring/blending asphalt comprising:

a shaft;

at least one plate attached to said shaft; and

a plurality of openings in said at least one plate.

33. The apparatus of claim 32 comprising three plates.

34. The apparatus of claim 33 wherein a central plate has no openings.

35. The apparatus of claim 32 wherein said plate(s) are circular.

36. The apparatus of claim 35 wherein said plate(s) comprise an approximately five-inch radius.

37. The apparatus of claim 32 wherein said plate(s) comprise circular openings.

38. The apparatus of claim 32 wherein said plate(s) comprise four openings.

39. The apparatus of claim 38 wherein each said opening is spaced at a ninety-degree angle from its neighboring opening with respect to a center of said plate.

40. The apparatus of claim 38 wherein centers of said four openings are located at a point approximately seventy percent of a distance from a center of said plate to an edge of said plate.

41. The apparatus of claim 40 wherein a radius of each of said four openings is approximately twenty percent of a distance from a center of said plate to an edge of said plate.

42. The apparatus of claim 32 additionally comprising a plurality of plates and a plurality of spacers on said shaft interposed between said plurality of plates.

43. The apparatus of claim 42 wherein said spacers are approximately 1/8 inch thick.

44. The apparatus of claim 32 preventing shear of a mixture being processed.